AMENDMENTS

Listing of the Claims:

The following listing of claims replaces all previous listing or version thereof:

1-49. (canceled)

50. (currently amended) A method of analyzing a fluid sample comprising:

passing one milliliter or less of a fluid sample through a membrane-based flow sensor assembly comprising a membrane, wherein the fluid sample comprises lymphocytes that are at least partially retained by the membrane;

contacting the lymphocytes collected on the membrane with a visualization agent that can be used to distinguish CD4 positive lymphocytes from other lymphocytes;

collecting an image of the collected lymphocytes and analyzing the collected lymphocytes on the membrane; and

determining the number of CD4 positive lymphocytes on the membrane.

51. (previously presented) The method of claim 95, wherein the wavelengths of light are selected from the group consisting of red, blue and green.

52. (previously presented) The method of claim 96, wherein the collecting the image data and forming the masks is performed by a computer.

53. (previously presented) The method of claim 96, further comprising determining the amount of CD4+ lymphocytes present on the membrane by analysis of the image resulting from subtracting the first mask and the second mask from the image of the collected lymphocytes in white light.

54. (currently amended) The method of claim 50, wherein the ~~images are~~ image is collected using a digital detection device.

55-82. (canceled)

83. (previously presented) The method of claim 50, further comprising:

passing a background fluid across the membrane;

detecting an image of matter captured on the membrane after passing the background fluid through the membrane; and

cleaning the surface of the membrane;

comparing the image of lymphocytes captured on the membrane after passing the sample fluid containing one or more lymphocytes through the membrane to the image of matter captured on the membrane after passing the background fluid through the membrane.

84. (currently amended) The method of claim 50, wherein the ~~images are~~ image is collected using a detector, and wherein a programmable controller is coupled to the detector.

85. (canceled)

86. (previously presented) The method of claim 50, wherein the visualization agent comprises a label, wherein the label is configured to emit light only in a specified portion of the visible spectrum.

87. (previously presented) The method of claim 96, wherein the first mask is a binary mask.

88. (previously presented) The method of claim 96, wherein the second mask is a binary mask.

89. (previously presented) The method of claim 96, wherein the visualization agent comprises a label, and wherein further the label is configured to emit light only in a green portion of the visible spectrum, and wherein the second wavelength of light comprises a blue portion of the visible spectrum, and wherein the third wavelength of light comprises a red portion of the visible spectrum, and wherein subtracting the first mask and the second mask from the image of the collected lymphocyte in white light comprises isolating the matter on the membrane that only emits light in the green portion of the visible spectrum.

90. (previously presented) The method of claim 50, wherein the images are collected using a CCD detector.

91. (previously presented) The method of claim 50, wherein the images are collected using a CCD detector coupled to a microscope.

92. – 94. (canceled)

95. (previously presented) The method of claim 50, wherein the image is collected using white light, at a first wavelength of light, a second wavelength of light, and a third wavelength of light.

96. (previously presented) The method of claim 51, further comprising forming a first mask corresponding to an image of the collected material at the second wavelength of light; forming a second mask corresponding to an image of the collected material at the third wavelength of light; and subtracting the first mask and the second mask from the image of the collected lymphocytes in white light.

97. (previously presented) The method of claim 50, wherein the fluid sample is a blood sample.

98. (previously presented) The method of claim 86, wherein the label is a fluorescent label.

99. (previously presented) The method of 50, wherein the visualization agent comprises an anti-CD4 antibody.